# Section Two:
# Research Highlights
# 2007 - 2008

**The projects included in this portion of the document are in progress and have not yet reached the analysis stage, or represent long-term monitoring efforts. Management recommendations for these projects will be reported in subsequent KDFWR Research Summary documents.**

# Wildlife

## Big Game

### Assessment of Reproductive Output for White Tailed Deer in Kentucky

*Tina Brunjes and Dave Yancy, KDFWR*

*White-tailed deer fawn/James Inman*

To effectively manage white tailed deer (*Odocoileus virginianus*), one of the most important game species in Kentucky, accurate productivity estimates are necessary. Productivity (the number of offspring produced per unit of time; e.g. fawns/year), along with other variables such as sex and age ratios, are essential parameters used by The Kentucky Department of Fish and Wildlife Resources (KDFWR) to generate state-wide population models for white tailed deer. These population models are used to make informed management decisions regarding hunting season regulations; consequently, the accuracy of model parameters is critical.

White tailed deer productivity has been shown to fluctuate greatly from year to year, and these fluctuations are attributable to a variety of factors. For example, deer productivity is generally higher in areas where the food supply is of a higher quality/more abundant, and lower during low-mast years, years of drought, or in populations with a large proportion of yearling females. Given the ability of herd population dynamics to vary from year to year, KDFWR collects reproductive data in all regions of the state (Purchase, Green River, Bluegrass, Northeast, and Southeast) on a yearly basis. These efforts are ongoing and rely on state-wide participation from field staff. Each year, road-killed does are opportunistically examined by KDFWR biologists to determine whether each doe is pregnant, the number of fetuses, fetal sex ratio, and the approximate date of conception (calculated by measuring the fetus, estimating age based on size, and backdating). These data are compiled and analyzed every two years, with the next 2-year cycle ending June 2008.

Although we have not yet analyzed reproductive data from the current collection cycle, we will ultimately compare reproductive parameters across regions of Kentucky, assess changes in productivity since the last data collection cycle, and adjust population models accordingly. During the last data collection cycle (2005-2006), reproductive output was collected from more than 100 does representing all 5 regions of the Commonwealth. From this sample, 82% of adult does were pregnant, fetal sex ratios approached 50% male : 50% female, and average date of conception was 27 November. By collecting state-wide reproductive information on a yearly basis, KDFWR is better equipped to make regionally-specific management decisions regarding white tailed deer in Kentucky.

**Funding Sources:** Pittman Robertson (PR) and Non Federal Aid (NFA)

**KDFWR Strategic Plan. Goal 1. Strategic Objectives 4 and 5.**

# Big Game

## Chronic Wasting Disease Surveillance in Kentucky

*Tina Brunjes and Gabe Jenkins, KDFWR*

Chronic Wasting Disease (CWD) is a fatal, neurological disease, characterized by spongy degeneration of the brain. This disease affects white-tailed deer, mule deer, elk, and has recently been confirmed in a moose. CWD belongs to a group of diseases called Transmissible Spongiform Encephalopathies (TSE), which includes Scrapie in sheep and goats, Bovine Spongiform Encephalopathy (commonly known as "mad cow" disease) in cattle, and Creutzfeldt-Jakob Disease in humans. It is suspected that the agent responsible for causing TSEs is an abnormal protein called a prion. There is currently no treatment or vaccine available.

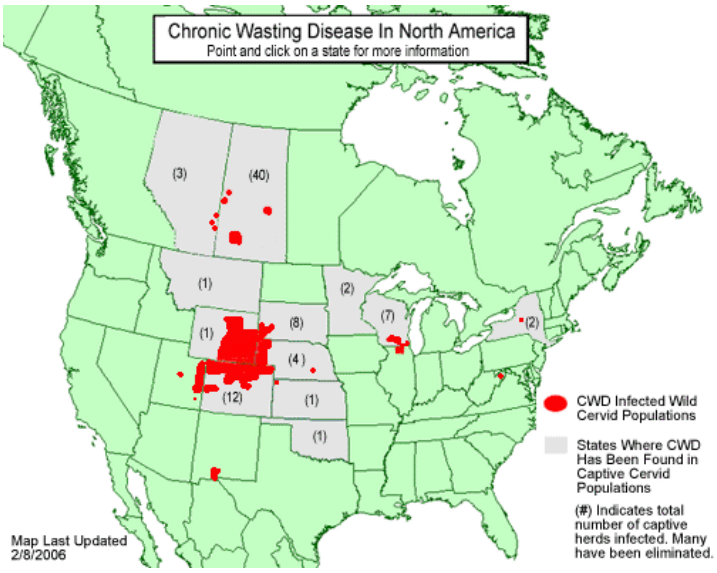
Since 2002, KDFWR has implemented an intensive statewide surveillance program, which includes two types of surveillance approaches: a) active surveillance of hunter-harvested deer and elk and b) targeted surveillance of any deer or elk displaying symptoms of the disease. We are increasingly testing more road-killed animals, as well. Since 2002, KDFWR has tested over 12,000 deer and elk for CWD; all results have been negative. Additionally, all captive cervid facilities within the state are enrolled in the CWD-monitoring program through the Kentucky Department of Agriculture. Our statewide Chronic Wasting Disease surveillance efforts will continue in 2008 to ensure early detection of CWD within the Commonwealth, should it occur in the future.

**Funding Source:** United States Department of Agriculture

**KDFWR Strategic Plan. Goal 1, Strategic Objective 4c. Comprehensive Wildlife Conservation Strategy: Appendix 3.3; Priority Conservation Action #132.**

*CWD Sampling/KDFWR*

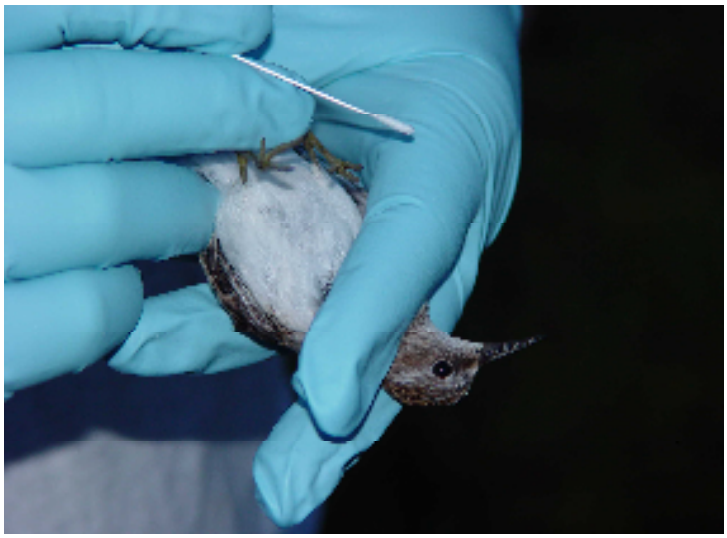
***CWD Distribution in North America, 2006 Center for Disease Control***



# Migratory Bird Program

## Avian Influenza Monitoring throughout Kentucky

*Rocky Pritchert and John Brunjes, KDFWR*



*Avian influenza sampling/John Brunjes*

Avian influenza, commonly referred to as "bird flu," is an illness caused by one of several different strains of influenza viruses that have adapted to specific avian hosts. Although many different subtypes of avian influenza exist, the highly pathogenic Influenza A subtype (high path H5N1) has been the cause of global concern as a potential pandemic threat. Millions of poultry have been killed by this subtype throughout Africa, Asia, and Europe, and there is concern about the possibility of genetic exchange between human and avian viruses. If this genetic exchange were to occur, the potential result would be a novel, possibly lethal, virulent influenza strain that is easily transmissible from human to human. Thus far, approximately 200 humans have died from the high-path H5N1 avian influenza strain and disease-control centers worldwide have prioritized the study of this pathogen.

As a result of worldwide concern regarding the presence and transmission of the high-path H5N1 strain of avian influenza, the U.S. Department of Agriculture (USDA) has launched a national avian influenza surveillance program. The primary objective of this program is to partner with states to embark on sampling and surveillance efforts sufficient to detect this pathogen should it exist within the Unites States. By collecting cloacal and tracheal samples from waterfowl, shorebirds, and other migratory birds and submitting these samples to the National Animal Health Laboratory Network (NAHLN) for testing, early detection of the high-path H5N1 strain is possible. In Kentucky, KDFWR has collected approximately 725 samples from a broad geographic area within the state, all of which have tested negative for the high-path H5N1 strain of avian influenza. Represented in this sample are 665 hunter-killed birds, 59 live birds, and one dead bird, and species surveyed include Mallards, Canada Geese and an assortment of other Anseriformes. If deemed necessary by the USDA, we plan to continue these surveillance efforts in the Commonwealth in 2008.

**Funding Source:** Non Federal Aid (NFA)

**KDFWR Strategic Plan. Goal 1, Strategic Objective 1c. Comprehensive Wildlife Conservation Strategy: Appendix 3.3; Priority Conservation Action #132.**

## Migratory Shorebirds, Colonial Water Bird, and Woodcock Investigations

*John Brunjes and Rocky Pritchert, KDFWR*

*American woodcock/USFWS*

Kentucky's wetlands serve as important migratory stop over sites during spring and fall migration for many species, including species of conservation concern such as the lesser yellowlegs, buff-breasted sandpiper, and king rail. In contrast to the extensive life history data available for many waterfowl species, very little information exists regarding species composition, peak population, abundance, migration chronology, and habitat selection of migratory shorebirds and colonial nesting water birds. This information is necessary to understand the ecology and population trends of these birds and to subsequently focus management efforts on important habitats during critical periods of each species' annual cycle. In response to these research needs, KDFWR cooperated with state and federal agencies in 2007 to continue research and management of migratory shorebirds and colonial nesting water birds in Kentucky.

This project began in 2007 with far-reaching cooperative efforts to monitor and manage colonial water bird, migratory shorebird, and woodcock populations. In 2007, we initiated a partnership with the Tennessee Valley Authority to conduct shorebird surveys on Lake Barkley and Kentucky Lake following International Shorebird Survey (ISS) protocols. Additional accomplishments include extensive data management efforts such as the compilation of information from amateur birdwatchers and the compilation of information on nesting sites of wading birds in Kentucky. These data sets will be used to develop a chronology of migration through Kentucky, which will be useful in assessing relative abundances of shorebird and water bird species and, for the wading birds, to assess changes in abundance and distribution. We also completed a pilot project resulting in the capture and banding of 219 shorebirds at the Ballard Wildlife Management Area, and the capture and banding of American woodcocks from three Wildlife Management Areas. In addition to continued banding and survey work in 2008, we plan to use remote sensing techniques to create a model which predicts American woodcock abundance across Kentucky. These survey, banding, and data modeling efforts will provide a platform by which long-term trends may be assessed, and management actions that are consistent with long-term welfare of specific populations may be implemented.

**Funding Source:** State Wildlife Grant Program (SWG)

**KDFWR Strategic Plan. Goal 1. Strategic Objective 5.**

## Monitoring and Management of Kentucky's Waterfowl

*Rocky Pritchert, John Brunjes, Mike Morton and Pat Hahs, KDFWR*

Over the past decade, periodic aerial surveys have been implemented by KDFWR to monitor winter waterfowl populations within Kentucky. These wide-reaching surveys are conducted multiple times per year and include the Lower Ohio River and Western Coalfield, Western Kentucky's Purchase Region, the Rough River, as well as Central and Eastern Kentucky. Surveys are conducted along established flight routes and ducks (dabblers and divers), geese (Canada, snow, and blue), and coots are counted during each flight. Bald eagles are also counted, when present, on these survey routes. Over the 2006/2007 season, we conducted six waterfowl surveys between 29 November 2006 and 15 February 2007. We surveyed 518,469 ducks, 409,606 geese, 12,948 coots, and 72 eagles for a total of 941,023 birds. Although waterfowl populations exist within each of these survey routes, waterfowl populations within the Western Kentucky Purchase Region are consistently greater than elsewhere in the Commonwealth. These periodic waterfowl surveys are extremely important because they provide much-needed information pertaining to population sizes and timing of migration; without this information, waterfowl management in Kentucky would be a daunting task. We anticipate that these waterfowl surveys will continue in 2008 and beyond, to ultimately provide land managers and biologists with long-term waterfowl trends within Kentucky.

*Waterfowl/John Inman*

**Funding Source:** Non Federal Aid (NFA)

**KDFWR Strategic Plan. Goal 1, Objective 5.**

## Monitoring Giant Canada Goose Populations in Kentucky

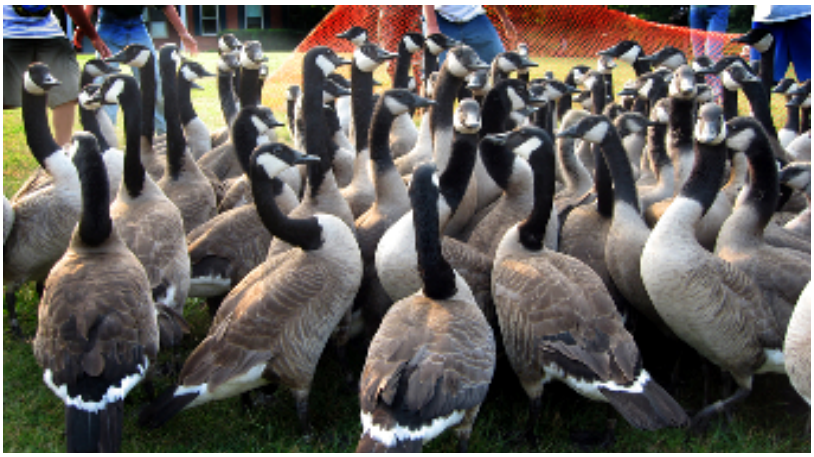
*Rocky Pritchert and John Brunjes, KDFWR*

*Goose banding/KDFWR*

Waterfowl managers use banding data to assess location of migration routes, speed and timing of migration, and to determine numerous basic life history parameters. According to Ducks Unlimited, the Canada Goose (*Branta Canadensis*) is the second most commonly banded species (mallard ducks are most commonly banded), with over 2.8 million birds banded through 2004. Although Canada Goose populations are globally secure, Kentucky, Virginia, Alabama, and Louisiana list this species as vulnerable (S3 designation; Natureserve Explorer). Fortunately, management efforts coupled with recent trends of mild Kentucky winters have resulted in increases in temperate nesting Canada goose populations in the Commonwealth, especially in the central and eastern two-thirds of the state. The Kentucky Department of Fish and Wildlife Resources has been a long-time participant (since the mid 1980s) in Canada Goose banding efforts. In 2007, 2,530 birds were banded from 25 sites, representing 1,441 adults and 1,089 hatch year birds. The sex ratio for these birds approached 50:50 (we were able to sex approximately 71% of captured geese). Of the 2,530 total birds captured, 759 of these were recaptures, and, of the 25 sites surveyed, previously banded geese were re-captured at 22 of these sites. Kentucky's increasing population of Canada geese has afforded increased hunting opportunities. Several decades ago, hunting opportunities were largely limited to the western portion of the state; today, giant Canada geese are present on water bodies state-wide. Through the continued collection of data from capture and banding efforts, KDFWR will be able to make informed management decisions regarding season dates and bag limits and insure a sustainable and healthy population of these birds in Kentucky.

**Funding Source:** Non Federal Aid (NFA)

**KDFWR Strategic Plan. Goal 1, Objective 5.**



*Goose Round-up/KDFWR*

## Mourning Dove Banding in Kentucky

*John Brunjes, KDFWR*

Although mourning doves are considered one of the most common bird species in eastern North America, long-term, nationwide monitoring (beginning in 1966) has revealed downward population trends. Given the economic and social importance of mourning doves, KDFWR initiated a dove banding program in 2002 to better monitor and mange Kentucky's mourning dove population. To date, more than 10 thousand bands have been applied to mourning doves in all five regions of Kentucky. In 2007, banding efforts occurred between July and August, and we successfully banded 1,626 birds from 52 sites statewide. Of these captured birds, 727 were adults and 886 were young birds, and we were able to determine the sex of 701 birds of which 61% were male and 39% were female. We recovered 145 bands in 2007, and have recovered over 500 bands since the onset of this program. Although most recoveries occurred in Kentucky, doves banded in Kentucky have also been recovered in Illinois, Indiana, Arkansas, Missouri, Ohio, West Virginia, North Carolina, South Carolina, Georgia, Florida, Tennessee, Mississippi, Oklahoma, Texas, and North Dakota.

*Mourning Dove with band/KDFWR*

In addition to banding, KDFWR also collects wings from harvested mourning doves. In 2007, 3,574 wings representing 22 sites were obtained from collection barrels, check stations manned by KDFWR personnel, and mail surveys to hunters. Valuable life history data were obtained from these wings including: age at harvest, sex ratios of harvested birds and information on the timing of nesting activities. We plan to continue banding and monitoring Kentucky's mourning dove population in 2008. By gathering regionally-specific life history data, we will be able to make optimally informed harvest management decisions.

**Funding Source:** Non Federal Aid (NFA)

**KDFWR Strategic Plan. Goal 1, Objective 5.**

## Nest Surveys for the Interior Least Tern in Kentucky

*John Brunjes, KDFWR*

The interior least tern (*Sterna antillarum*) is the smallest member of the tern family and is known to breed in areas along the Ohio, Mississippi, Red, Missouri, and Rio Grande river systems. Many factors have contributed to the decline of this species; most notably, historic nesting sites have been eliminated by flooding caused by the construction of dams, reservoirs, and other water control structures. Other factors contributing to population declines include: nest disturbance caused by recreational activities, historic over-harvest (during the turn of the century), and urban pests such as cats and rats. Interior least terns gained the status of federal protection under the U.S. Endangered Species Act in 1985, and the U.S. Fish and Wildlife Service issued a formal recovery plan in 1990. This recovery plan stresses the need for range wide population and productivity monitoring and the importance of increased efforts to assess movements and post-fledging survival.

In Kentucky, the interior lest tern persists in scattered areas of suitable habitat along the Mississippi and Ohio Rivers. Since monitoring is vital to recovery efforts, KDFWR began conducting nest surveys in suitable habitat in 2005. In 2007, we located 449 nests representing twelve tern nesting sites on the Ohio and Mississippi Rivers; the largest colony contained 161 nests and was located in Carlisle County. In addition to nest surveys, we plan to expand monitoring efforts in 2008 by collecting nesting and hatching success data. We also plan to evaluate and compare the habitat suitability (as it relates to nest and hatch success) of man-made and natural islands along the Ohio River. Concurrent with these monitoring efforts, we plan to post signs and have a sustained KDFWR presence in these areas during the nesting season in an attempt to minimize human disturbance and maximize hatch success for these birds in Kentucky.

**Funding Source:** State and Tribal Wildlife Grant (SWG)

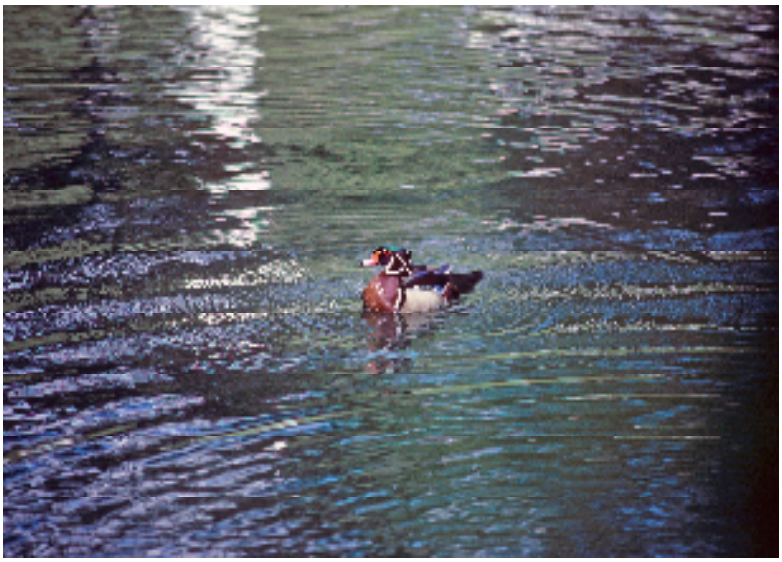
**Comprehensive Wildlife Conservation Strategy: Appendix 3.4; Class Aves: Taxa-specific conservation action #1.**

*Least tern chick/John Brunjes*

## Proactive Wood Duck Management in Kentucky

*Rocky Pritchert and John Brunjes, KDFWR*

Wood ducks are the most common breeding duck in Kentucky, and 2007 marked yet another year of successful wood duck management by the Kentucky Department of Fish and Wildlife Resources. Historically, KDFWR has proactively managed wood duck populations through banding, band recovery efforts, nest box implementation, and careful regulation of hunting. These management efforts have been important in restoring wood duck populations, which approached unsustainable lows due to over-hunting and habitat destruction in the early 1900's. Fortunately, wood ducks are now common, permanent residents of Kentucky, and long-term banding programs are the most efficient ways to monitor these populations. In 2007, KDFWR greatly exceeded the U.S. Fish and Wildlife Service's wood duck banding quota for Kentucky by banding 1,618 wood ducks from 14 sites (the quota was 896 birds). In total, we banded 292 adults and 1,323 hatch year birds (786 female and 829 male). KDFWR bands more wood ducks than any other state within the Mississippi Flyway and, since 2001, the average number of wood ducks banded in Kentucky per year is 1,883. This ambitious wood duck banding program has allowed Kentucky's September wood duck season to transition from an experimental season to an operational season; this means KDFWR no longer has to justify the September season to the U.S. Fish and Wildlife Service on a yearly basis. During wood duck and other banding efforts in 2007, we banded an additional 4,200 individuals representing 13 species including gadwall, American wigeon, American black duck, and Northern pintail. We plan to continue these efforts to band and monitor wood ducks, and opportunistically band other waterfowl species, in 2008 and beyond.



*Wood duck/KDFWR*

**Funding Source:** Non Federal Aid (NFA)

**KDFWR Strategic Plan. Goal 1, Objective 5.**

# Small Game Program and Turkey

## A New Approach to Mast Surveys in Kentucky

*Ben Robinson and John Morgan, KDFWR*

*Mast Survey/KDFWR*

Hard mast (nuts and acorns produced by oak, hickory, and beech) is an essential food resource for many eastern U.S. wildlife species, and has been shown to affect the density, reproductive success, and health of deer, bear, wild turkey, grouse and rodent populations. Since higher predators such as raptors, snakes, and foxes feed on these mast-eating animals, the annual production (or lack) of hard mast has the ability to influence multiple levels of the food chain. To fully understand temporal fluctuations in animal populations, it is extremely important to monitor and survey annual mast production. For example, drastic declines in animal populations that are not associated with poor masting years may be indicative of disease, low within-population genetic diversity, or other problems with population health. Mast abundance also affects animal movements within normal home ranges.

Although Kentucky Department of Fish and Wildlife Resources (KDFWR) started mast surveys in 1953, these initial efforts were largely qualitative. In 2007, KDFWR adopted the Northeast Wild Turkey Technical Committee's protocol, to begin participation in a standardized regional mast survey effort. This protocol involves the identification and permanent marking of 25 dominant or co-dominant tree groups per route. Once routes are established, each tree is visited between 15 August and 1 September, and binoculars are used to scan the canopy to determine the percent of crown with acorns. During our first year of standardized mast surveys, we conducted 37 total routes; 37 of these were complete routes comprised of white oak, red oak, and hickory, 19 of these included beech. Mast success in 2007 was relatively low, with the proportion of trees bearing acorns ranked as "poor" (20 – 39%) for white oak, "good" (60-79%) for red oak, failure (0 – 19%) for hickory, and "poor" (20-39%) for beech. We plan to continue conducting standardized mast surveys in 2008 and beyond to establish a baseline understanding of hard mast cycles in the Commonwealth.

*Gray squirrel/KDFWR*

**Funding Source:** Non Federal Aid (NFA)

**KDFWR Strategic Plan. Goal 1. Strategic Objective 5a.**

## Monitoring Efforts for Northern Bobwhite Populations in Kentucky

*John Morgan and Ben Robinson, KDFWR*

The northern bobwhite (*Colinus virginianus*) was once a widespread and familiar component of Kentucky's rural landscape. Revered by both hunters and non-hunters alike, this bird is known for its melodious "bob-white" whistle, its attractive appearance, and the thunderous sound of covey on the rise. Unfortunately, habitat changes over the past century have resulted in declining quail populations. The transition from small, diverse family farms to large, specialized industrial agriculture has been implicated as one of the driving forces behind these population reductions. Historically, American agriculture was characterized by small fields containing a diversity of crops, fallow fields comprised of brambles and shrubs, and un-mowed field edges, resulting in a patch-work of habitat types and plentiful edge habitat. In contrast, current agricultural practices are of the large-scale monoculture variety; these farms do not typically contain quality edge-habitats or quail-friendly interfaces (e.g. all fence rows are sprayed or mowed). These changing agricultural practices coupled with the brutal, atypical Kentucky winters in 1977 and 1978 have resulted in catastrophic quail population declines.


*Bobwhite Quail/ Joe Lacefield*

Since 1960, KDFWR has made an annual effort to monitor population health of northern bobwhite within the Commonwealth. These efforts are now more important than ever because of our recently-launched "Kentucky Northern Bobwhite Conservation Initiative," an effort to stabilize and increase northern bobwhite populations via ambitious plans to improve habitat. Without monitoring information, it will be difficult to evaluate the success of this conservation initiative.

Currently KDFWR uses three mechanisms to monitor quail in Kentucky: mail carrier surveys, quail wing surveys, and hunter log surveys. Mail carrier surveys are conducted

during the last full week of July by rural mail carriers throughout the state. Mail carriers record all quail observations as well as total mileage for each day; the resulting information is used to develop a population index to inform management decisions for upcoming hunting seasons. During the hunting season quail wings are collected from hunters and back-dated to determine age of harvested birds; additionally, hunters report the sex of these animals. Lastly, many hunters in Kentucky voluntarily complete a hunter log survey, a diary-type log kept throughout the hunting season. In this log, hunters record specific information such as hours hunted, number of coveys flushed, and number of birds harvested. These data are divided into weekly and monthly increments to monitor seasonal differences in quail detectability.

In 2007, mail carriers returned 744 of the approximately 1,600 survey cards issued, and rural carriers covered 238,741 miles and observed 1,326 quail. The state-wide observation rate was 0.55 quail/100 miles, a value slightly lower than that recorded in 2006. For the quail wing survey, 52 successful quail hunters mailed in 495 wings. Of the back-dated wings, 90% were considered to be juveniles and 10% were aged as adults, while 54% of the birds were male and 46% were female. Hunter logs received from 43 hunters (392 hunts in 48 counties) indicated that hunters flushed 0.39 coveys per hour, harvested 0.87 birds per hour, and, on average, harvested 2.74 birds per hunt. Our monitoring programs will continue in 2008, and we will continue to use these data to evaluate the success of our targeted habitat restoration efforts and adjust our management actions accordingly.

**Funding Source:** Non Federal Aid (NFA)

**KDFWR Strategic Plan. Goal 1. Strategic Objective 5a. Comprehensive Wildlife Conservation Strategy: Appendix 3.4. Class Mammalia: Prioritized taxa-specific conservation action #1.**


*Bobwhite Quail/Joe Lacefield*

## Wild Turkey Reproduction in Kentucky

*Steven Dobey, KDFWR*

Since 1984, KDFWR has conducted summer brood surveys to estimate recruitment and reproduction of turkeys in Kentucky. Volunteers participate in surveys statewide beginning in July and ending in August. These participants keep a log which contains information regarding when adult and poult turkeys are sighted and provides location details for each sighting. Compiled brood survey data is used to assess sex ratios, brood sizes, and the overall recruitment ratio (how many young enter the population based on number of hens in the population) for turkeys in Kentucky. Many factors have an influence on turkey recruitment and reproduction from year to year (e.g. drought, predation rates, population density). By establishing a long-term monitoring program via brood surveys, we will be able to make informed management decisions which take into consideration seasonal reproductive fluctuations. In 2007, we collected over 375 turkey brood surveys representing all regions of the state. Our goal for 2008 is to increase participation and expand survey effort to gain a better understanding of reproductive parameters statewide. Through these continued brood survey efforts, we will be better equipped to identify and implement goals and strategies to guide wild turkey management decisions in the Commonwealth.

*Wild Turkey/Dave Baker*

**Funding Source:** Non Federal Aid (NFA)

**KDFWR Strategic Plan. Goal 1. Strategic Objective 5a.**